

Table 20.17 from (1983AJ01): Energy levels of ^{20}Ne ^a

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
0	$0^+; 0$	0_1^+		stable	2, 3, 7, 8, 9, 13, 17, 18, 22, 23, 24, 25, 30, 31, 32, 33, 38, 39, 40, 41, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 62, 63, 64, 67, 68, 69, 70, 71, 72, 77
1.633674 ± 0.015	$2^+; 0$	0_1^+	$\tau_m = +1.05 \pm 0.06$ psec $g = +0.54 \pm 0.04$	γ	2, 3, 7, 8, 9, 10, 13, 17, 18, 21, 22, 23, 24, 25, 27, 29, 30, 31, 32, 33, 38, 39, 40, 41, 42, 45, 47, 48, 50, 51, 52, 55, 62, 63, 64, 67, 68, 69, 70, 71, 72, 77
4.2477 ± 1.1	$4^+; 0$	0_1^+	$\tau_m = 93 \pm 9$ fsec $g = -0.01 \pm 0.14$	γ	2, 3, 7, 8, 9, 13, 17, 18, 21, 22, 23, 24, 25, 27, 29, 30, 31, 32, 38, 39, 40, 41, 47, 48, 50, 51, 55, 64, 67, 68, 69, 70, 71, 72
4.96651 ± 0.20	$2^-; 0$	2^-	$\tau_m = 4.8 \pm 0.5$ psec	γ	2, 3, 7, 8, 9, 13, 17, 30, 33, 38, 39, 40, 41, 42, 47, 64, 67, 68, 71, 72
5.6214 ± 1.7	$3^-; 0$	2^-	200 ± 50 fsec	γ, α	2, 3, 7, 8, 13, 17, 27, 38, 40, 41, 47, 65, 67, 70, 71, 72
5.785 ± 2.3	$1^-; 0$	0^-		γ, α	2, 3, 7, 8, 13, 14, 17, 18, 27, 31, 39, 40, 41, 47, 65, 67, 70, 71
6.724 ± 5	$0^+; 0$	0_2^+	$\Gamma = 15 \pm 7$ keV	γ, α	8, 13, 17, 30, 38, 39, 41, 45, 47, 67, 71
7.004 ± 3.6	$4^-; 0$	2^-	$\tau_m = 440 \pm 90$ fsec	γ	2, 7, 8, 17, 39, 47, 71
7.1563 ± 0.5	$3^-; 0$	0^-	$\Gamma = 8.1 \pm 0.3$ keV	γ, α	2, 4, 7, 8, 13, 14, 17, 18, 20, 23, 29, 30, 31, 38, 39, 47, 71
7.191 ± 3	$0^+; 0$	0_3^+	4	γ, α	5, 6, 7, 13, 14, 45, 47, 71
7.4214 ± 1.0	$2^+; 0$	0_2^+	8	γ, α	2, 5, 6, 7, 13, 14, 17, 39, 41, 45, 47, 63, 65, 71
7.8290 ± 2.0	$2^+; 0$	0_3^+	2.4	γ, α	2, 6, 7, 13, 14, 30, 38, 39, 45, 47, 63, 65, 71
≈ 8.3	$0^+; 0$	0_4^+	≈ 800	α	14, 39
8.4486 ± 2.3	$5^-; 0$	2^-	0.013 ± 0.004	γ, α	2, 6, 7, 13, 14, 17, 23, 39, 47, 71
8.699 ± 5	$1^-; 0$	(1^-)	2.1 ± 0.8	γ, α	7, 13, 39, 47, 71

Table 20.17 from (1983AJ01): Energy levels of ^{20}Ne ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
8.7767 ± 2.3	$6^+; 0$	0_1^+	< 3	γ, α	2, 4, 6, 7, 13, 14, 17, 18, 20, 21, 23, 29, 30, 38, 39, 47, 71
≈ 8.8	$2^+; 0$	0_4^+	> 800	α	14
8.848 ± 5	$1^-; 0$	1^-	19	α	7, 13, 14, 39, 65, 71
9.030 ± 4	$4^+; 0$	0_3^+	3.2	γ, α	2, 6, 7, 13, 14, 39, 47, 71
9.1124 ± 2.4	$3^-; 0$		3.2	γ, α	2, 7, 13, 14, 38, 39, 47, 71
9.310 ± 6	$(1, 2, 3)^+$				7, 39, 47, 71
9.466 ± 7					71
9.508 ± 12	$2^+; 0$		29 ± 15	γ, α	13, 14, 38, 39, 47, 63
9.873 ± 4	$3^+; 0$			γ	7, 39, 63
9.935 ± 12	$(1^+); 0$		$\tau_m < 35$ fsec	γ	39, 71
10.005 ± 17	$4^+; 0$	0_2^+	$\Gamma = 155 \pm 30$	γ, α	2, 13, 14, 30, 38, 39, 71
10.261 ± 4	$5^-; 0$	0^-	145 ± 40	α	2, 4, 7, 14, 17, 18, 20, 23, 29
10.2724 ± 2.0	$2^+; 1$		0.4 ± 0.2	γ, α	13, 14, 30, 39, 63, 65, 71
10.403 ± 5	$3^-; 0$	1^-	80	α	7, 14, 31, 39, 65, 71
10.548 ± 5	$4^+; 0$		16	α	7, 14, 39
10.583 ± 6	$2^+; 0$		24	α	14, 39, 63, 71
10.609 ± 6	$6^-; 0$	2^-	$\tau_m = 23 \pm 7$ fsec	γ	2, 6, 7
10.694 ± 6	$4^-, 3^+; 0$			γ	6, 7
10.79 ± 100	$4^+; 0$	0_4^+	$\Gamma = 350$	α	14
10.837 ± 5	$2^+; 0$		13	α	14, 39, 63
10.840 ± 6	(3^-)	(1^-)	45	α	7, 14
10.89 ± 10	$3^+; 1$		$\tau_m < 30$ fsec	γ	7, 39, 63, 65
10.97 ± 150	$0^+; 0$		$\Gamma = 580$	α	14
11.015 ± 6	$4^+; 0$		24	α	6, 7, 14, 71
11.087 ± 3	$4^+; 1$		≤ 0.5	γ, α	13, 14, 39, 65
11.23 ± 10	$1^+; 1$			γ	38, 45, 63, 65
11.261 ± 5	$1^-; 0$		170	α	14
11.268 ± 4	$1^-; 1$		≤ 0.3	γ, α	13, 14, 39, 63, 65
11.322 ± 7	$2^+; 0$		40 ± 10	α	14, 63
11.528 ± 6	$3^+, 4^-; 0$		$\tau_m \leq 30$ fsec	γ	7
11.555 ± 6	$1^+, 2^-, 3^+$			γ	7, 39
11.556 ± 6	$(2^+, 0^+)$		$\Gamma = 1.1 \pm 0.5$	γ, α	13, 14
11.601 ± 10	$2^-; 1$				65
11.66	$(3^+); 0$			γ	6, 7
11.866 ± 9	$2^+; 0$		46	α	7, 14, 39, 63, 71
11.925 ± 4	$4^+; 0$		0.44 ± 0.15	γ, α	13, 14, 71

Table 20.17 from (1983AJ01): Energy levels of ^{20}Ne ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
11.950 \pm 4	8 ⁺ ; 0	0 ₁ ⁺	$(3.5 \pm 1.0) \times 10^{-2}$	γ, α	4, 6, 7, 8, 13, 14, 17, 18, 20, 21, 23, 71
11.962 \pm 8	1 ⁻ ; 0		30 \pm 5	α	14, 71
12.100 \pm 10	2 ⁻ ; 1				65
12.136 \pm 4	6 ⁺ ; 0	0 ₃ ⁺	0.13 \pm 0.07	α	5, 6, 7, 8, 14, 17
12.218 \pm 4	2 ⁺ ; 1		< 0.1	γ, α	13, 30, 38, 39
12.24 \pm 30	4 ⁺ ; 0		148 \pm 20	α	14
12.253 \pm 3	3 ⁻ ; 1		< 1	γ, α	13, 14
(12.35 \pm 100)	(2 ⁺)		\approx 500	α	14
12.394 \pm 4	3 ⁻ ; (1)		37.3 \pm 0.9	γ, α	6, 7, 13, 14, 39, 71
12.436 \pm 4	0 ⁺ ; 0	0 ₆ ⁺	24.4 \pm 0.5	γ, α	7, 13, 14, 30, 39, 71
12.582 \pm 12	6 ⁺ ; 0	0 ₄ ⁺	70 \pm 20	α	6, 7, 14, 17, 18, 20, 21, 71
12.600 \pm 10	6 ⁺ ; 0		130 \pm 20	α	6, 7, 14, 17, 18, 20, 21, 71
12.683 \pm 15	5 ⁻ ; 0	1 ⁻	97	α	14
12.730 \pm 10	4 ⁺ ; 0		100	α	6, 7, 14
12.83 \pm 30			55	α	14, 30, 39
12.919 \pm 10					7, 71
13.010 \pm 10	(4 ⁺ ; 0)		60	α	7, 14
13.049 \pm 10	(4 ⁺ ; 0)		70	α	6, 7, 14, 39
13.060 \pm 3.5	2 ⁻		1.0	p, α	36, 38, 39
13.1680 \pm 0.6	1 ⁺ ; (1)		2.3 \pm 0.2	γ, p, α	33, 34, 36, 38
13.190 \pm 10	(4 ⁺ ; 0)		60	α	6, 7, 14
13.225	1 ⁻		95	p, α	36
13.225	0 ⁺		95	p, α	36
13.3038 \pm 0.7	1 ⁺		0.9 \pm 0.1	γ, p, α	33, 34, 36
13.334 \pm 6	7 ⁻ ; 0	2 ⁻	$(8 \pm 3) \times 10^{-2}$	α	6, 7, 8, 14
13.343 \pm 6	4 ⁺ ; 0		20 \pm 5	α	14
13.412 \pm 1	2 ⁻		26 \pm 3	γ, p, α	14, 33, 34, 36
(13.42 \pm 140)	(4 ⁺ ; 0)		110	α	14
13.462 \pm 20	1 ⁻		190	p, α	36
13.482 \pm 1	1 ⁺ ; 1		6.4 \pm 0.3	γ, p, α	33, 34, 36, 38
13.519	(1 ⁻)		33	p, α	34, 36
13.569 \pm 15	2 ⁺		63	p, α	7, 36
13.583 \pm 2	2 ⁺		9 \pm 1	p, α	30, 34, 36
13.644 \pm 2	0 ⁺ ; 1		17 \pm 1	p, α	7, 34, 36, 38
(13.66)	(1 ⁻)		110	p, α	7, 36
13.6729 \pm 0.7	(2 ⁻)		4.5 \pm 0.2	γ, p, α	33, 34, 36
13.7 \pm 400	(3, 7) ⁻		320	α	14

Table 20.17 from (1983AJ01): Energy levels of ^{20}Ne ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
(13.73)	(0 ⁺)		≈ 170	p, α	36
13.733 \pm 1.4	1 ⁺		7.7 \pm 0.5	γ , p, α	33, 34, 36
13.845 \pm 15	(1 ⁻)		≈ 190	p, α	7, 36
13.878 \pm 1	2 ⁺ ; 1		0.14 \pm 0.05	γ , p, α	7, 8, 33, 34, 36, 38
13.904	2 ⁺		47	p, α	30, 36
13.923 \pm 1	0 ⁺		≈ 70	p, α	36
13.926 \pm 9	6 ⁺	0 ₂ ⁺	113 \pm 7	α	6, 7, 17, 18
14.017	1 ⁻		≈ 70	p, α	36
14.060 \pm 1	2 ⁺		≈ 140	p, α	34, 36
14.124 \pm 1	2 ⁻		4.7 \pm 0.7	γ , p, α	33, 34, 36
14.127 \pm 3	2 ⁺		34 \pm 1	p, α	7, 14, 36
14.147 \pm 1	2 ⁻		11.8 \pm 1.0	γ , p, α	33, 34, 36
14.195	1 ⁺		14 \pm 1	γ , p	30, 33, 34
14.298 \pm 12	6 ⁺		100 \pm 20		6, 7, 14, 17, 18
14.311 \pm 10	6 ⁺		< 50	α	7
14.367 \pm 1	0 ⁺		86 \pm 5	p, α	7, 34, 36
14.451 \pm 2			33 \pm 3	p, α	34, 36
14.471 \pm 6	0 ⁺		68 \pm 2	p, α	36
14.594 \pm 7	1 ⁻		116 \pm 5	p, α	36
14.6 \pm 300	(4 ⁺)		240	α	14
14.650 \pm 10				p, α	36
14.695 \pm 2.5	(0 ⁺ , 1 ⁺)		36 \pm 10	p, α	34, 36
14.772 \pm 3.0			110 \pm 20	p, α	34, 36
14.812 \pm 15	(2 ⁺ , 4 ⁺)		≈ 100	p, α	6, 7, 14, 36
15.034 \pm 15	(2 ⁺)		≈ 100	p, α	7, 14, 36
15.159 \pm 5	6 ⁺	(0 ₆ ⁺)	60 \pm 15	α	6, 7
15.23			28	p, α	36
15.27	(1 ⁻)		285	p, α	36
15.30	(0 ⁺)		285	p, α	14, 36
15.336 \pm 15	7 ⁻	0 ⁻	380 \pm 60	α	4, 6, 7, 17, 18, 20, 21, 29
15.438 \pm 10			100 \pm 20	p, α	7, 36
15.47			55	p, α	36
b					
15.70 \pm 15	(6 ⁺)			α	6, 7, 14
15.874 \pm 9	8 ⁺	0 ₃ ⁺	100 \pm 15	α	5, 6, 7, 21, 29
(15.97)	(6 ⁺)			α	14
16.01 \pm 25	(2 ⁺ ; 1)		100	p, α	30, 36
16.139 \pm 15			38	p, α	6, 7, 14, 36

Table 20.17 from (1983AJ01): Energy levels of ^{20}Ne ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
16.25				α	6, 14
16.326 \pm 15	4 ⁺		43	p, α	14, 36
16.434 \pm 15	(0, 2, 4) ⁺		34	α	14
16.506 \pm 11	6 ⁺		25 \pm 3	α	6, 14
16.579 \pm 8	7 ⁻	1 ⁻	86 \pm 6	α	7, 14, 17, 18, 20
16.600 \pm 15	7 ⁻	1 ⁻	$\Gamma = 160 \pm 30$	α	7
16.634 \pm 14	3 ⁻		51 \pm 14	α	14
16.671 \pm 12	4 ⁺		79 \pm 11	α	14
16.716 \pm 8	(5, 3) ⁻		14 \pm 7	α	6, 7, 14
16.730 \pm 3	0 ⁺ ; 2		2.0 \pm 0.5	γ , p, α	30, 33, 34, 36
16.8	7 ⁻			α	7
16.850 \pm 11	5 ⁻		16 \pm 5	α	14
16.98			100	p, α	36
17.156 \pm 11	5 ⁻		33 \pm 3	α	14
17.205 \pm 12	4 ⁺		142 \pm 9	α	14
17.259 \pm 11	7 ⁻ (9 ⁻)		162 \pm 20	α	7
17.301 \pm 14	8 ⁺	0 ₄ ⁺	52 \pm 10	α	4, 14, 17, 18, 20, 21, 29
17.394 \pm 14	9 ⁻	2 ⁻	241 \pm 13	α	6, 7, 8, 14
17.542 \pm 15	6 ⁺		136	α	14
17.55 \pm 10	(2 ⁺ ; 1)		19	n, p, α	30, 35, 36
17.752 \pm 15	4 ⁻ , (0 ⁺)		36	p, α	14, 36
17.91 \pm 20	(0 ⁺)			n, p	30, 35
18.002 \pm 15	7 ⁻		< 10	α	14
18.024 \pm 8	5 ⁻		35 \pm 3	α	14
18.119 \pm 8	7 ⁻		29 \pm 3	α	6, 7, 8, 14
18.32 \pm 20	(6 ⁺)		240	α	6, 14
18.427 \pm 7	2 ⁺ ; 2		9.5 \pm 3	γ , n, p, α	33, 34, 35, 36
18.538 \pm 7	8 ⁺	(0 ₆ ⁺)	138 \pm 13	α	7
18.7 \pm 100	(6 ⁺ , 7 ⁻)		600	α	14, 17
19.113 \pm 10	6 ⁺		149 \pm 18	α	8, 14
19.322 \pm 9	6 ⁺		123 \pm 10	α	14, 30
19.437 \pm 10	6 ⁺		102 \pm 7	α	14
19.648 \pm 10	6 ⁺		89 \pm 8	α	14
19.914 \pm 12	5 ⁻		203 \pm 19	α	14
20.130 \pm 17	7 ⁻		156 \pm 21	α	14, 17
20.317 \pm 12	7 ⁻		203 \pm 19	α	14
20.433 \pm 16	6 ⁺		346 \pm 32	α	14
20.478 \pm 11	8 ⁺	0 ₂ ⁺	250 \pm 30	α	7

Table 20.17 from (1983AJ01): Energy levels of ^{20}Ne ^a (continued)

E_x (MeV \pm keV)	$J^\pi; T$	K^π	τ_m or $\Gamma_{c.m.}$ (keV)	Decay	Reactions
20.683 \pm 9	(9 ⁻)		75 \pm 9	α	7, 14, 18
20.782 \pm 11	7 ⁻		122 \pm 13	α	14, 17
20.920 \pm 12	7 ⁻		181 \pm 22	α	7, 14
21.056 \pm 26	9 ⁻	(1 ⁻)	120 \pm 50	α	4, 7, 18, 20, 29
21.3 \pm 100	7 ⁻ , 8 ⁺		300	α	14, 17
21.65 \pm 100	(7 ⁻ , 9 ⁻)		240 \pm 50	α	7, 14, 17
22.03 \pm 100	(8 ⁺)		630 \pm 80	α	7, 14, 17
22.7 \pm 100	9 ⁻		500 \pm 150	α	7, 14
22.87 \pm 40	9 ⁻	0 ⁻	225 \pm 40	α	4, 7, 14, 18, 20
23.70 \pm 30	9 ⁻ , (8 ⁺)		230 \pm 100	α	7, 14, 17, 18
24.21 \pm 25	8 ⁺		\approx 500	α	14, 18
24.374 \pm 30	7 ⁻ , (5 ⁻)		200 \pm 50	α	7
25.10 \pm 50	8 ⁺		\leq 200	α	14, 18
25.67 \pm 50			\approx 500	α	14, 18
27.1 \pm 100	(9 ⁻)		700	α	14, 17
28	8 ⁺		1600	α	14, 26
28.1 \pm 100	(10 ⁺)		700	α	14, 17

^a See also [Table 20.18](#).

^b For other states with $E_x > 15.5$ MeV see [Tables 20.27, 20.28, 20.29](#) and [20.30](#) and [reactions 1, 43](#) and [45](#). It is clear that there are many states with low angular momentum and with unnatural parity which have not been located at high E_x .